

**TECHNOLOGY BASED BUSINESS INCUBATORS
DEVELOPE A MODEL FOR SRI LANKA**

**MASTER OF BUSINESS ADMINISTRATION
IN
MANAGEMENT OF TECHNOLOGY**



University of Moratuwa, Sri Lanka.
Electronic Theses & Dissertations
www.lib.mrt.ac.lk

T.S.P De Silva
Department of Management of Technology
University of Moratuwa
December 2005

TECHNOLOGY BASED BUSINESS INCUBATORS DEVELOP A MODEL FOR SRI LANKA

By

T.S.P De Silva

This dissertation was submitted to the Department of Management of Technology of the University of Moratuwa in partial fulfilment of the requirements for the degree of Master of Business Administration in Management of Technology



University of Moratuwa, Sri Lanka.
Electronic Theses & Dissertations
www.moratuwa.lk

Supervised by

Dr. Chandana Perera

Department of Management of Technology

University of Moratuwa

December 2005

65"05"
62:65(043)

University of Moratuwa



86362

Table of Contents

| | |
|-------------------------|------|
| DECLARATION | VI |
| ABSTRACT | VII |
| ACKNOWLEDGEMENTS | VIII |

Chapter 1

| | | |
|-----|-----------------------|---|
| 1.0 | Introduction | 1 |
| 1.1 | Background | 1 |
| 1.2 | Problem Statement | 3 |
| 1.3 | Objectives of Study | 4 |
| 1.4 | Significance of Study | 5 |
| 1.5 | Research Design | 6 |

Chapter 2

| | | |
|-----|---|----|
| 2.0 | Literature Review | 7 |
| 2.1 | Introduction | 7 |
| 2.2 | Definitions of Incubators | 8 |
| 2.3 | Business Incubator Classifications | 12 |
| 2.4 | Technology Based Organizations | 15 |
| 2.5 | Public sector support for incubators & its objectives | 19 |
| 2.6 | Best Practices | 21 |
| 2.7 | Conclusion | 25 |

Chapter 3

| | | |
|-----|----------------------|----|
| 3.0 | Research Methodology | 27 |
|-----|----------------------|----|

Chapter 4

| | | |
|-------|--|----|
| 4.0 | Business Incubators in Sri Lanka, present status & catalytic factors available to support incubator industry | 29 |
| 4.1 | Introduction | 29 |
| 4.2 | Ruhuna Business Incubator (RBI) | 33 |
| 4.2.1 | Strategic Objectives of RBI | 34 |
| 4.2.2 | RBI Board of Directors | 34 |
| 4.2.3 | Facilities & Services provided by RBI | 36 |
| 4.2.4 | Staffing | 36 |
| 4.2.5 | Present Tenants | 37 |
| 4.2.6 | Past Tenants | 38 |

| | | |
|--------|---|----|
| 4.2.7 | Cost recovery system of RBI | 38 |
| 4.2.8 | Difficulties faced by RBI | 39 |
| 4.2.9 | Difficulties faced by RBI Tenants | 39 |
| 4.2.10 | Factors affecting to reduce success rate | 40 |
| 4.3 | IT Incubator- Conceptnursery.com | 42 |
| 4.3.1 | Vision of IT Incubator | 43 |
| 4.3.2 | Objectives of IT Incubator | 43 |
| 4.3.3 | Tenant selection criteria | 43 |
| 4.3.4 | Services Provide by the incubator | 43 |
| 4.3.5 | Present Tenants | 44 |
| 4.3.6 | Graduated Companies | 44 |
| 4.3.7 | Cost Recovery system of IT Incubator | 45 |
| 4.3.8 | Staffing | 46 |
| 4.3.9 | Factors affecting to reduce success rate | 46 |
| 4.4 | Catalytic factors available in Sri Lanka for supporting incubator Environment | 48 |
| 4.4.1 | National Science & Technology Policies | 48 |
| 4.4.2 | National Science & Technology Infrastructure | 51 |
| 4.4.3 | Short-term & Long-Term Financial Support | 52 |
| 4.4.4 | Venture Capital | 54 |
| 4.4.5 | Marketing Support | 54 |
| 4.4.6 | Private sector organizations & NGOs | 57 |
| 4.4.7 | United Nations Intervention | 59 |

Chapter 5

| | | |
|--------|---|----|
| 5.0 | Analysis of Selected Country Cases Technology Industrial Clusters, Technology Parks & Incubators | 60 |
| 5.1 | Value Parks, Industrial Clusters & Technology Parks | 60 |
| 5.1.1 | Value Park initiative of Germany | 60 |
| 5.1.2 | North Carolina Bio-Technology Centre | 62 |
| 5.1.3 | Minnesota's Information & Technology Cluster | 62 |
| 5.1.4 | Hsinchu Industrial Cluster & ITRI Incubator-Taiwan | 63 |
| 5.1.5 | Software Park- Thailand | 66 |
| 5.1.6 | Technology Park- Victoria, Australia | 70 |
| 5.1.7 | Ballarat Technology Park | 75 |
| 5.1.8 | La Trobe R&D Park | 75 |
| 5.1.9 | Monash Science & Technology Park | 76 |
| 5.1.10 | Werribee Food & Agriculture Technology Precinct | 76 |

| | | |
|----------------------|--|-----|
| 5.2 | Analysis of Country Cases-Incubator Industry/Incubators | 77 |
| 5.2.1 | Business Incubator Industry in China | 77 |
| 5.2.1.1 | Chinese case studies | 84 |
| 5.2.2 | Business Incubator Industry in Brazil | 89 |
| 5.2.2.1 | Brazilian Case Studies | 94 |
| 5.2.3 | Business Incubator Industry in Nigeria | 96 |
| 5.2.3.1 | Nigerian Case Studies | 98 |
| 5.2.4 | Development in other industrializing countries | 99 |
| Chapter 6 | | |
| 6.0 | Developing a Technology Business Incubator model | 102 |
| 6.1 | Analysis of incubator attributes – Selected Country cases vs. existing incubators | 104 |
| 6.1.1 | Services provided by incubators | 104 |
| 6.1.2 | Admission policy | 105 |
| 6.1.3 | Graduation Policy | 108 |
| 6.1.4 | Graduation Policy & Leases | 110 |
| 6.1.5 | Staffing | 112 |
| 6.1.6 | Criteria for Incubator Evaluation | 113 |
| 6.1.7 | Effective Local & International Linkages | 119 |
| 6.2. | Stakeholders of proposed incubator & their duties | 119 |
| 6.2.1 | Government of Sri Lanka | 120 |
| 6.2.2 | Universities | 121 |
| 6.2.3 | Research Organizations | 122 |
| 6.2.4 | Private Sector & NGOs | 122 |
| 6.2.5 | United Nations Organizations | 123 |
| 6.3 | Institutional & Organizational Aspects | 124 |

Chapter 7

| | |
|----------------|-----|
| 7.0 Conclusion | 127 |
|----------------|-----|

| | |
|-------------------|------------|
| REFERENCES | 131 |
|-------------------|------------|



University of Moratuwa, Sri Lanka.
Electronic Theses & Dissertations
www.lib.mrt.ac.lk

List of Tables

| | | |
|---------|---|-----|
| 2.6 | Public Sector cost per Direct Job created by Technology Incubator | 25 |
| 5.1.4a | ITRI Incubator tenants by Industry | 64 |
| 5.1.4b | Educational Background by Tenant Employees | 65 |
| 5.2.1a | Chinese Sources of Funds | 79 |
| 5.2.1b | Chinese Incubator Investment | 80 |
| 5.2.1c | Incubator firms by Industry- China | 81 |
| 5.2.1d | Sources of Tenant Employee- China | 82 |
| 5.2.1.1 | Tianjin Incubator Technology Orientation & Ownership | 86 |
| 5.2.2 | Cost recovery system- Brazilian Incubation Industry | 91 |
| 6.1.1 | Essential Elements in Incubator Facilities | 104 |



University of Moratuwa, Sri Lanka.
Electronic Theses & Dissertations
www.lib.mrt.ac.lk

List of Figures

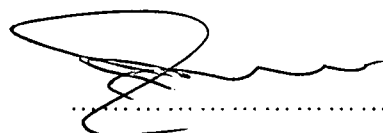
| | | |
|-----|---|-----|
| 4.3 | RBI Structure | 35 |
| 6.0 | 11 Factor Model for Technology based Business Incubator | 103 |

List of Boxes

| | | |
|-------|--|----|
| 4.4.1 | Industrialization Strategy for Sri Lanka | 50 |
| 5.5.1 | Services and Utilities available at Value Park | 61 |

DECLARATION

"I certify that this thesis does not incorporate without acknowledgement any material previously submitted for a degree or diploma in any University to the best of my knowledge and belief it does not contain any material previously published, written or orally communicated by another person or myself except where due reference is made in the text. I also hereby give consent for my dissertation, if accepted, to be made available for photocopying and for interlibrary loans, and for the title and summary to be made available to outside organizations"



Signature of the Candidate




University of Moratuwa, Sri Lanka
Electronic Theses & Dissertations
www.lib.mrt.ac.lk

29-12-2005

Date

To the best of my knowledge, the above particulars are correct.



Supervisor

ABSTRACT

Believing the fact that Small and Medium entrepreneurial businesses are the key to economic success, policy makers understand that vast majority of new enterprises failed as a result of common problems: lack of capital, poor management skills, and insufficient understanding of the market place. Hence there was a necessity to find out solutions to address these issues and as a result business incubation concept emerged in early 1980's.

This was the starting point of business incubator concept and today Business Incubators and Technology Business Incubators become a popular economic development strategy through out the world since early 1980's.

The review of literature of business incubation industry suggests that there are well-developed theories of business/technology business incubators which includes definitions, classifications, and evaluation criteria and also set of best practices that have demonstrable positive effects on tenant firms.



Under this dissertation, it is discussed the present situation of the two existing business incubators in Sri Lanka, catalytic factors available to support incubation industry and the future prospects. An analysis has also been carried out to existing two Sri Lankan business incubators by comparing the selection criteria, graduation policies and best practices followed by the successful business incubators in selected countries. Also the causes of failures of these incubators in selected country cases taken into consideration in making the comparison.

The dissertation is concluded with the recommendations and future prospects of the incubator business where the country can be used this concept as an economic development strategy with common patterns emerged from diverse local practices defined by particular industry, environment and objectives.

ACKNOWLEDGEMENTS

I highly appreciate the efforts of the supervisor, Dr. Chandana Perera of Department of Management of Technology of University of Moratuwa, whose comments on earlier drafts of this dissertation significantly improve this report.

I would like to thank Dr. Nirmala M. Pieris, Head – Corporate Services Division, Mr. Sarath Abeysundera, National Project Coordinator, United Nations Industrial Development Organization, and Prof. Rustum Lalkaka who offered me their time and provided critical insights into the subject matter.

Also, the support rendered by Incubator Managers and their staff of Ruhuna Business Incubator and Conceptnursery.com, Officers of Trade Information Division of Export Development Board and Credit Managers of SME Bank made an immense contribution to this dissertation work.



University of Moratuwa, Sri Lanka.
Electronic Theses & Dissertations
www.lib.mrt.ac.lk